TM 11-6625-209-15

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

AUDIO LEVEL TEST PANEL TS-629B/U

HEADQUARTERS, DEPARTMENT OF THE ARMY

OCTOBER 1958

HEADQUARTERS,
DEPARTMENT OF THE ARMY
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Distribution:
Active Army:

ASA (2)
CNGB (1)
Technical Stf, DA (1) except CSigO (30)
Technical Stf Bd (1)
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USA Arty Bd (1)
USA Armor Bd (1)
USA Inf Bd (1)
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OS Maj Comd (5)
OS Base Comd (5)
Log Comd (5)
MDW (1)
Armies (5)
Corps (2)
Div (2)
USATC (2)
Svc Colleges (5)
Br Svc Sch (5) except USASCS (25)
Gen Depots (2) except Atlanta Gen Depot (None)
Sig Sec, Gen Depots (10)
Sig Depots (17)
Army Pictorial Cen (2)
Engr Maint Cen (1)
TASSA (13)
Mid-Western Rgn Ofc (TASSA) (1)
USA Sig Pub Agcy (8)
USA Sig Comm Engr Agcy (1)
USA Comm Agcy (2)
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USA White Sands Sig Agcy (13)
WRAMC (1)
AFIP (1)
AMS (1)
Ports of Emb (OS) (2)
OS Sup Agcy (2)
Yuma Test Sta (2)
USA Elct PG (1)
Sig Lab (5)
Sig Fld Maint Shops (3)
Fld Comd, AFSWP (5)
Mil Dist (1)
Sector Comd, US Army Corps (Res) (1)
US Army Corps (Res) (1)
JBUSMC (2)
Units organized under following TOE's:
11-7 (2)
11-16 (2)
11-57 (2)
11-127 (2)
11-128 (2)
11-500 (AA-AE) (2)
11-557 (2)
11-587 (2)
11-592 (2)
11-597 (2)

NG: State AG (6); units—same as Active Army except allowance is one copy to each unit.
USAR: None.
For explanation of abbreviations used, see AR 320-50.

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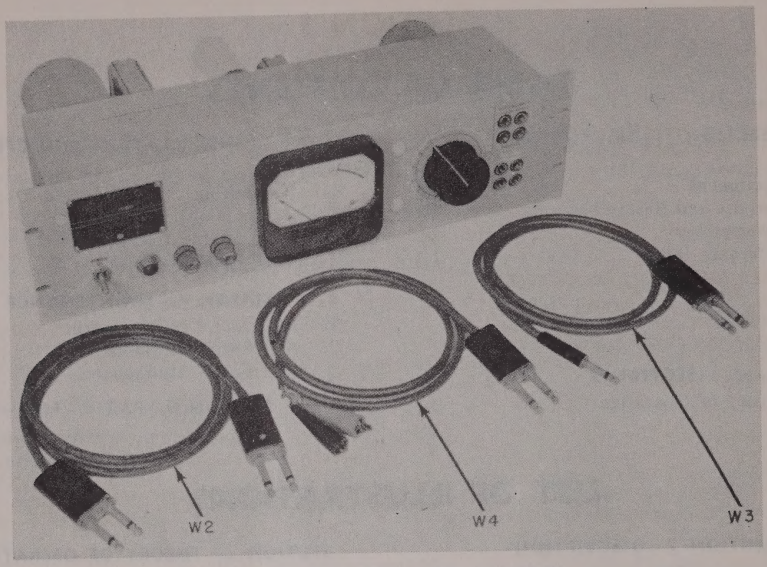


Figure 1-1. Audio Level Test Panel, TS-629B/U

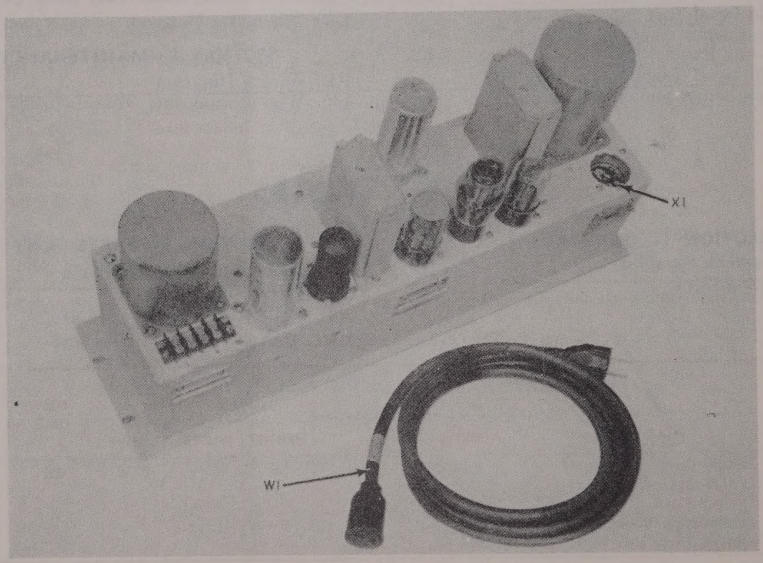


Figure 1-2. Audio Level Test Panel, TS-629B/U, Rear View

SECTION 1
DESCRIPTION

1. EQUIPMENT.

Figure 1-1 is a front view of the Audio Level Test Panel TS-629B/U with three patch cords. Figure 1-2 is rear view with power cord. All electrical components are impregnated and insulated for satisfactory operation under conditions up to 90% relative humidity. All components are moisture fungus-proofed.

2. PURPOSE AND BASIC PRINCIPLES.

The Audio Level Test Panel TS-629B/U is designed to accurately measure audio levels in broadcasting, sound recording, telephone transmission and allied fields where precise monitoring over the audio range is required.

3. DESCRIPTION.

The equipment consists primarily of a precision type wide range Volume Level Indicator, utilizing an internal audio frequency amplifier and its associated power supply, mounted on a standard 5¼" x 19" rack type panel. A thermal relay, with a 20 second delaying action, protects the meter from voltage "kick" when the power is turned on. Two screw-driver type controls are located on the front panel for meter calibration to adjust for any variation in component tolerances.

Two sets of input jacks allow for use either as a bridging unit with an input impedance of 12500 ohms or as a terminating type having an input of 600 ohms. The meter is adjusted for a reference level of 0 VU (1 milliwatt into 600 ohms). Any source of 105V-120V, 50-60 cycle power may be connected to the rear of the case through the cable and connections provided. The control knob is used to set range of the instrument between the limits of -40 +20 db on the outer scale (Terminating) and -20 +20 db on the inner scale (Bridging).

4. REFERENCE DATA.

a. NOMENCLATURE. — This equipment is known as the Audio Level Test Panel, TS-629B/U.

b. CONTRACT.—NObsr-63297 dated 11 March, 1953.

c. CONTRACTOR. — The Daven Company, Newark, New Jersey.

d. COGNIZANT NAVAL INSPECTOR. — Inspector of Naval Material, Newark, New Jersey.

e. NUMBER OF PACKAGES INVOLVED PER COMPLETE SHIPMENT.—One.

f. TOTAL CUBICAL CONTENTS.—2.1 cu. ft.

g. TOTAL WEIGHT.—35 lbs.

WEIGHT AND DIMENSIONS

	Unpacked		*Packed*	
Item	*Weight Pounds*	*Dimensions Inches*	*Weight Pounds*	*Dimensions Inches*
Unit	20	11 x 19 x5¼		
Spare Parts	6	7¼ x 10⅜ x 3½	35	22½ x 9 x 17½

TABLE 1-1. EQUIPMENT SUPPLIED

QUANTITY PER EQUIPMENT	NAME OF UNIT	NAVY TYPE DESIGNATION	OVER-ALL DIMENSIONS			VOLUME	WEIGHT
			HEIGHT	WIDTH	DEPTH		
1	Audio Level Test Panel	TS-629B/U	5¼	19	11	.63	20
3	Cable Assemblies						
1	Power Cord						
2	Instruction Books						
1	Spare Parts Box		3½	10⅜	7¼	.15	6

Unless otherwise stated, dimensions are inches, volume cubic feet, weight pounds.

TABLE 2-1. SHIPPING DATA

SHIPPING BOX NO.	CONTENTS		OVER-ALL DIMENSIONS			VOLUME	WEIGHT
	NAME	DESIGNATION	HEIGHT	WIDTH	DEPTH		
1	Audio Level Test Panel Cable Assemblies Power Cord Instruction Books Spare Parts Box	TS-629B/U	9	22½	17½	2.1	35

Unless otherwise stated, dimensions are inches, volume cubic feet, weight pounds.

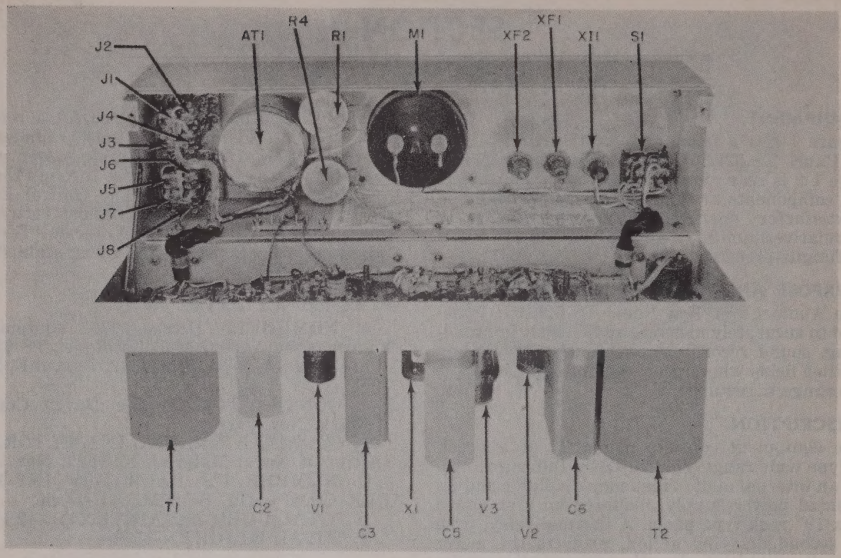


Figure 1-3. Audio Level Test Panel, TS-629B/U, Case Open Showing Rear of Front Panel

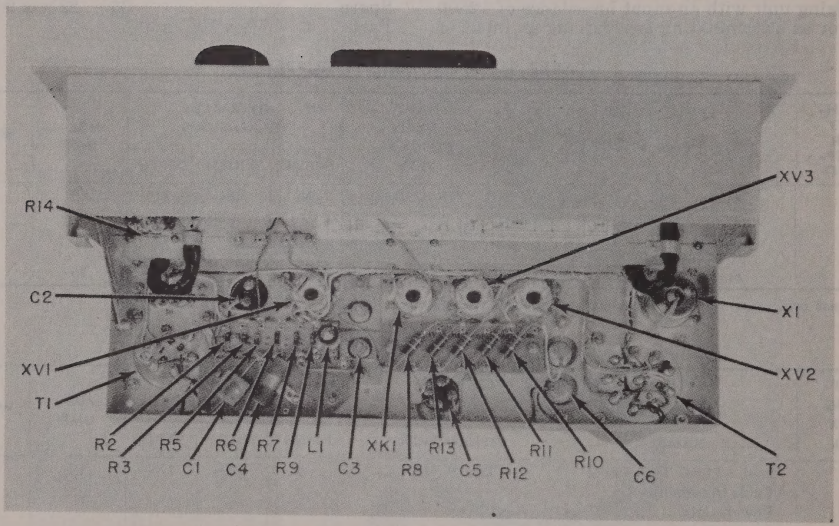


Figure 1-4. Audio Level Test Panel, TS-629B/U, Case Open Showing Chassis

SECTION 2
THEORY OF OPERATION

1. The Audio Level Test Panel TS-629B/U consists of the following:

a. A conventional transformer coupled, single phase, full wave power supply complete with RC type filter and voltage regulator tube.

b. A shielded, balanced, transformer input type, wide range audio amplifier complete with calibrated volume control.

c. A VU type indicating meter to accurately measure the output of the audio amplifier.

2. The panel controls consist of:

a. Power switch for turning Test Panel ON and OFF.

b. A pilot indicator light.

c. Two fuses (1 spare).

d. A VU meter calibrated in both VU and per cent utilization.

e. A calibrated meter range switch for setting the meter to 0 VU.

f. Two sets of Bridging Jacks, input impedance approximately 12,500 ohms, for high impedance input.

g. Two sets of Terminating Jacks, input impedance 600 ohms, for low impedance input.

The input circuit of the Audio Level Test Panel TS-629B/U consists of a shielded type input transformer, tapped for either 600 ohm input or 12,500 ohm input (with appropriate series primary resistors). This transformer is designed to cover the range –40 to +20 VU, and function properly under the following conditions for both bridging and terminating operation:

(*a*) Incoming line, neither side grounded.
(*b*) Incoming line, center grounded.
(*c*) Incoming line, either side grounded.

The secondary of this transformer is loaded with a 60,000 ohm step type, grid potentiometer, calibrated in 30 steps of 2 db per step to cover the range –40 to +20 VU. This grid potentiometer is followed by one stage of amplification, using a 6AG7 tube, pentode connected. The plate circuit of this amplifier stage is capacitor coupled to the VU type indicating meter.

The incoming signal passes from line transformer to the potentiometer (range control) to the amplifier and hence to the meter. The signal level is adjusted by means of the range control knob of the indicating meter. The signal being measured is the sum of the dial reading and VU meter reading. Two screw driver operated rheostats are located on the front panel for meter calibration. A thermal relay is used to keep the meter shorted for approximately 20 seconds to prevent damage by voltage surge when the power is turned on. Auxiliary contacts on the power switch protect the meter when the power is turned off. An additional period of at least 20 seconds should be allowed before measuring the signal, to assure correct operating temperatures.

The useful frequency range with accuracy of ±0.1 db is 200 to 10,000 cps. The roll off at 30 and 15,000 cps is approximately 0.5 db. A typical correction curve is shown. For accurate measurements, correct reading as indicated on this curve.

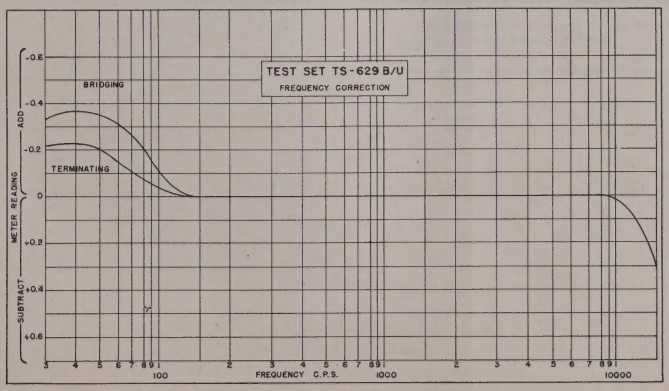


Figure 2-1. Frequency Correction Chart

SECTION 3
INSTALLATION

1. UNPACKING.

CAUTION:

THIS EQUIPMENT INCORPORATES DELICATE AND FRAGILE PARTS, WHICH HAVE BEEN PACKED CAREFULLY. ALL PARTS SHOULD BE UNPACKED AND HANDLED IN LIKE MANNER.

Open the carton and remove spare parts box and equipment proper. Remove outer paper wrapping, from the equipment proper, open box and remove cushioning, dessicant, cords and equipment. Do not open spare parts box until required, as items are individually sealed in moisture-proof bags.

2. INSTALLATION.

a. EQUIPMENT MOUNTING. The equipment is designed to mount on a standard 19″ relay rack.

b. CONNECTION. Use the AC power cable CD-370 (W1) to connect equipment to any 60 cycle, 115 volt source (Fig. 1-2). Connection is made to power receptacle X1 located on rear of panel (Fig. 1-2). Cables CX-2549/U (W2), CX-2550/U (W3), CX-2551/U (W4) are used for connecting to Bridging and Terminating Jacks (Fig. 1-1).

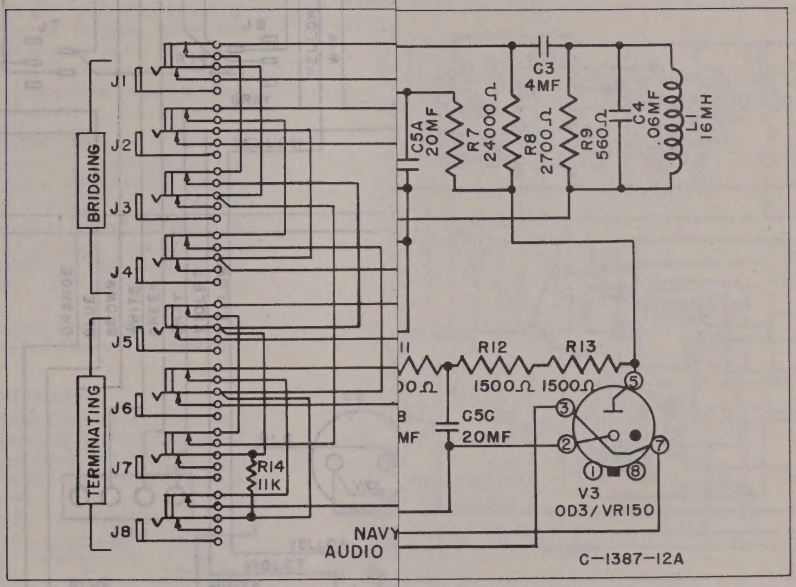
3. INITIAL ADJUSTMENTS.

Calibration. Two screw-driver type rheostats located at the right of the meter are provided for zero adjustments. Rheostat #2 controls both terminating and bridging calibration. Rheostat #1 controls only bridging and should be used only after #2 has been correctly set. To calibrate, set the external oscillator to 1,000 cycles at 0.775 volts, plug into Terminating Jacks, set range control at 0 Terminating (outside scale), then readjust oscillator to 0.775 volts. With calibrating meter reading 0.775 volts, remove plug buttons, adjust #2 control for 0 VU reading. After Terminating Input has been calibrated, set range switch at 0 VU Bridging (inside scale); plug into Bridging Jacks, reset the oscillator to 0.775 volts and adjust #1 rheostat for 0 VU.

4. OPERATION.

To operate, turn on power switch and green indicator lamp should glow. Allow 1 minute for tubes to warm up, then turn range control to full clockwise position, to prevent over-loading the meter. Connect the equipment under test by means of the appropriate patch cord and required jacks. Turn the range control knob until the meter reads approximately 0 VU. This reading is added to the dial reading, to give the audio level.

If it is desirable to terminate the line to be measured with 600 ohms, connect the line to Terminating Jacks. To monitor, without disturbing the signal, plug into the Bridging Jacks and tap across the line.


J1
J2
J3
J4
J5
J6
J7
J8
BRIDGING
TERMINATING
R14
11K
C3
4MF
C5A
20MF
R7
24000Ω
R8
2700Ω
R9
560Ω
C4
.06MF
L
16MH
R12
R13
1500Ω 1500Ω
C5C
20MF
V3
OD3/VR150
NAVY
AUDIO
C-1387-12A

gram

SECTION 3
INSTALLATION

1. UNPACKING.

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Calibration. Two screw-driver type rheostats located at the right of the meter are provided for zero adjustments. Rheostat #2 controls both terminating and bridging calibration. Rheostat #1 controls only bridging and should be used only after #2 has been correctly set. To calibrate, set the external oscillator to 1,000 cycles at 0.775 volts, plug into Terminating Jacks, set range control at 0 Terminating (outside scale), then readjust oscillator to 0.775 volts. With calibrating meter reading 0.775 volts, remove plug buttons, adjust #2 control for 0 VU reading. After Terminating Input has been calibrated, set range switch at 0 VU Bridging (inside scale); plug into Bridging Jacks, reset the oscillator to 0.775 volts and adjust #1 rheostat for 0 VU.

4. OPERATION.

To operate, turn on power switch and green indicator lamp should glow. Allow 1 minute for tubes to warm up, then turn range control to full clockwise position, to prevent over-loading the meter. Connect the equipment under test by means of the appropriate patch cord and required jacks. Turn the range control knob until the meter reads approximately 0 VU. This reading is added to the dial reading, to give the audio level.

If it is desirable to terminate the line to be measured with 600 ohms, connect the line to Terminating Jacks. To monitor, without disturbing the signal, plug into the Bridging Jacks and tap across the line.

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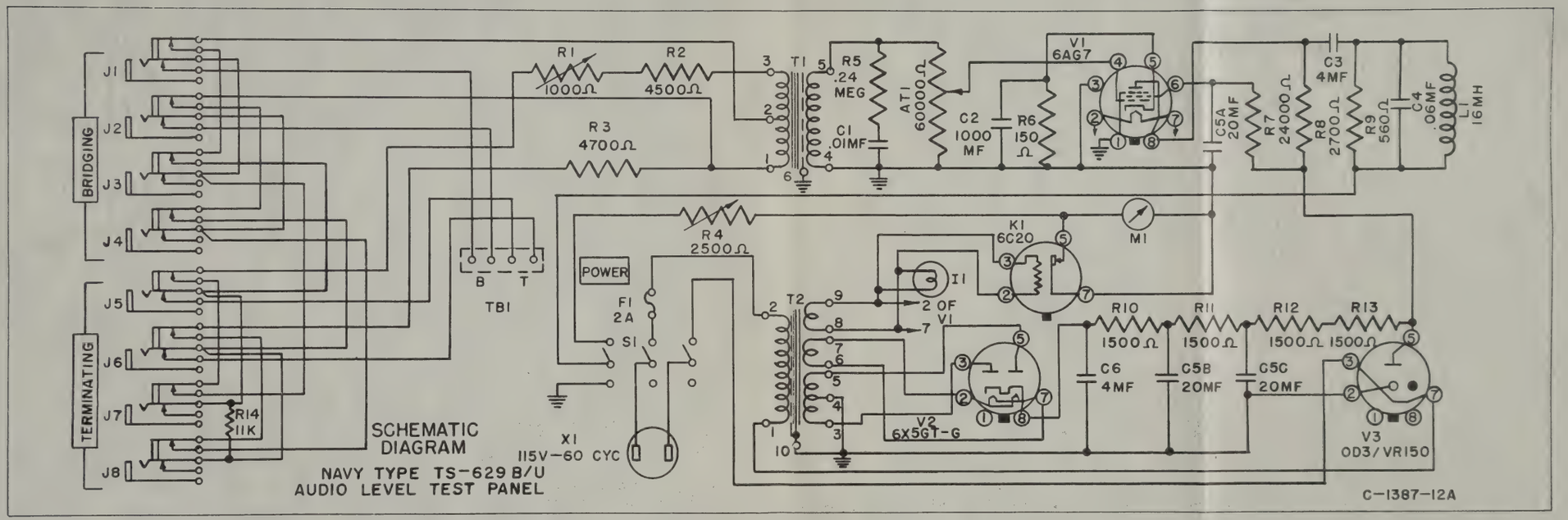
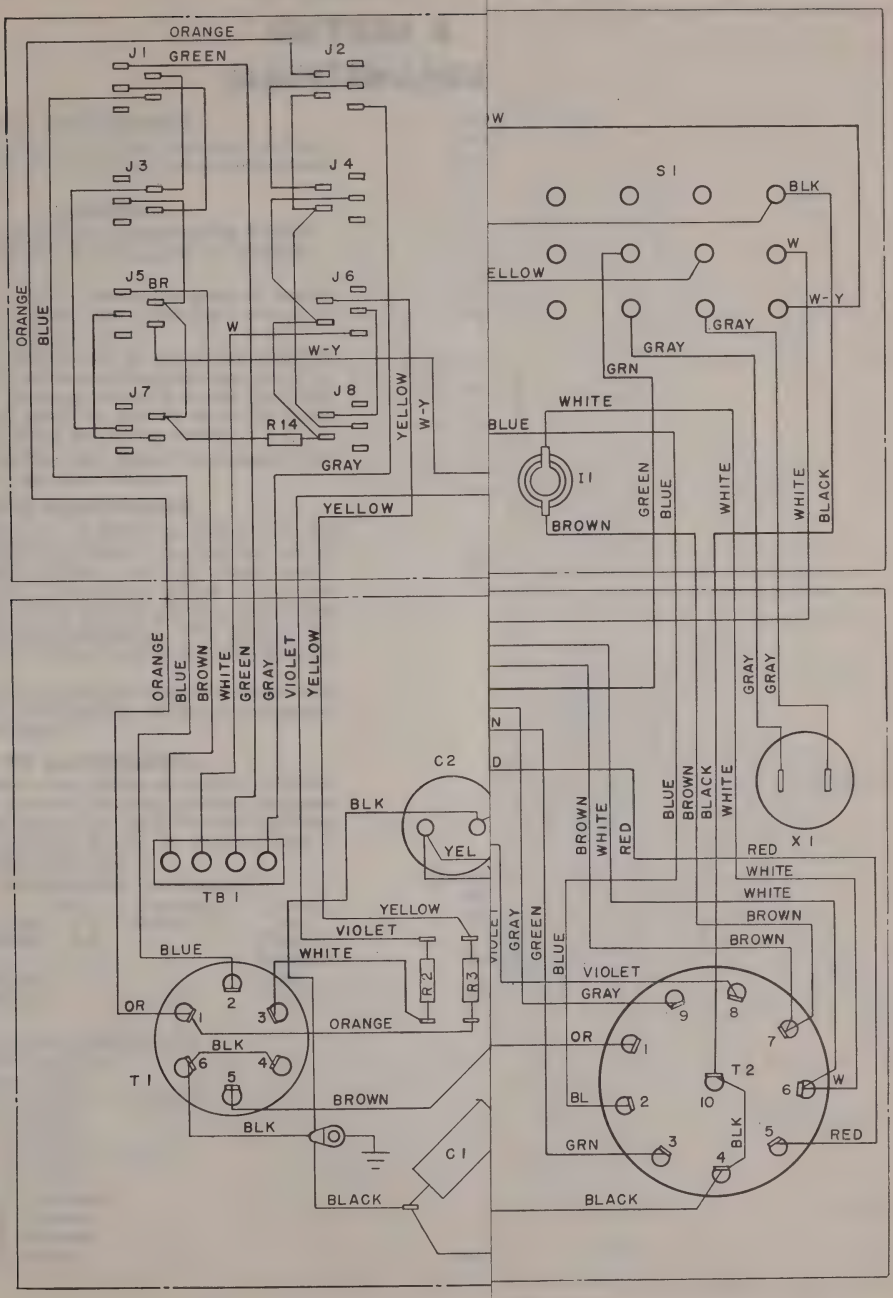
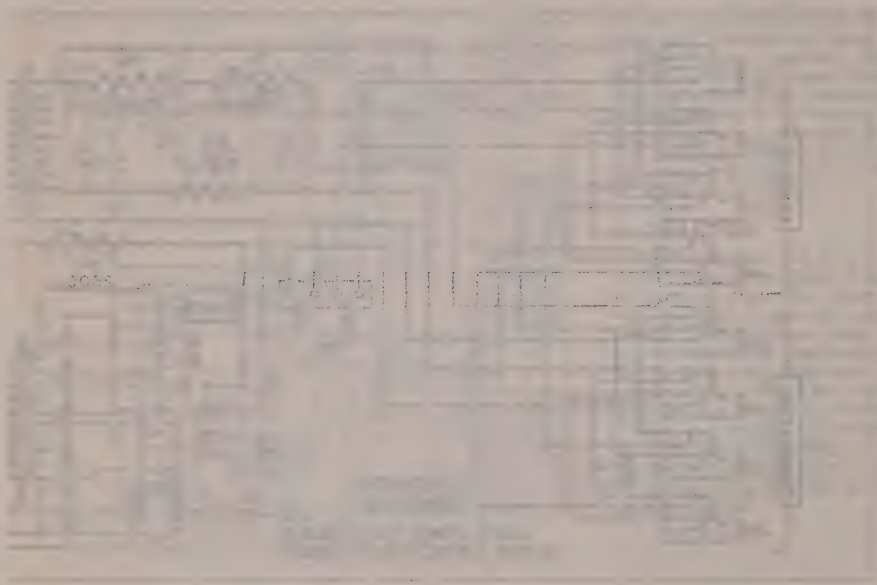


Figure 3-1, Schematic Diagram


ORANGE
J1
GREEN
J2
J3
J4
J5
BR
J6
W
W-Y
J7
J8
R14
GRAY
YELLOW
W-Y
ORANGE
BLUE
S1
BLK
W
W-Y
GRAY
GRAY
GRN
WHITE
BLUE
I1
BROWN
GREEN
BLUE
WHITE
WHITE
BLACK
ORANGE
BLUE
BROWN
WHITE
GREEN
GRAY
VIOLET
YELLOW
C2
BLK
YEL
TB1
YELLOW
VIOLET
WHITE
R2
R3
BLUE
OR
ORANGE
BLK
T1
BROWN
BLK
C1
BLACK
GRAY
GRAY
X1
RED
WHITE
WHITE
BROWN
BROWN
VIOLET
GRAY
OR
BL
GRN
BLK
BLACK
T2
RED
W



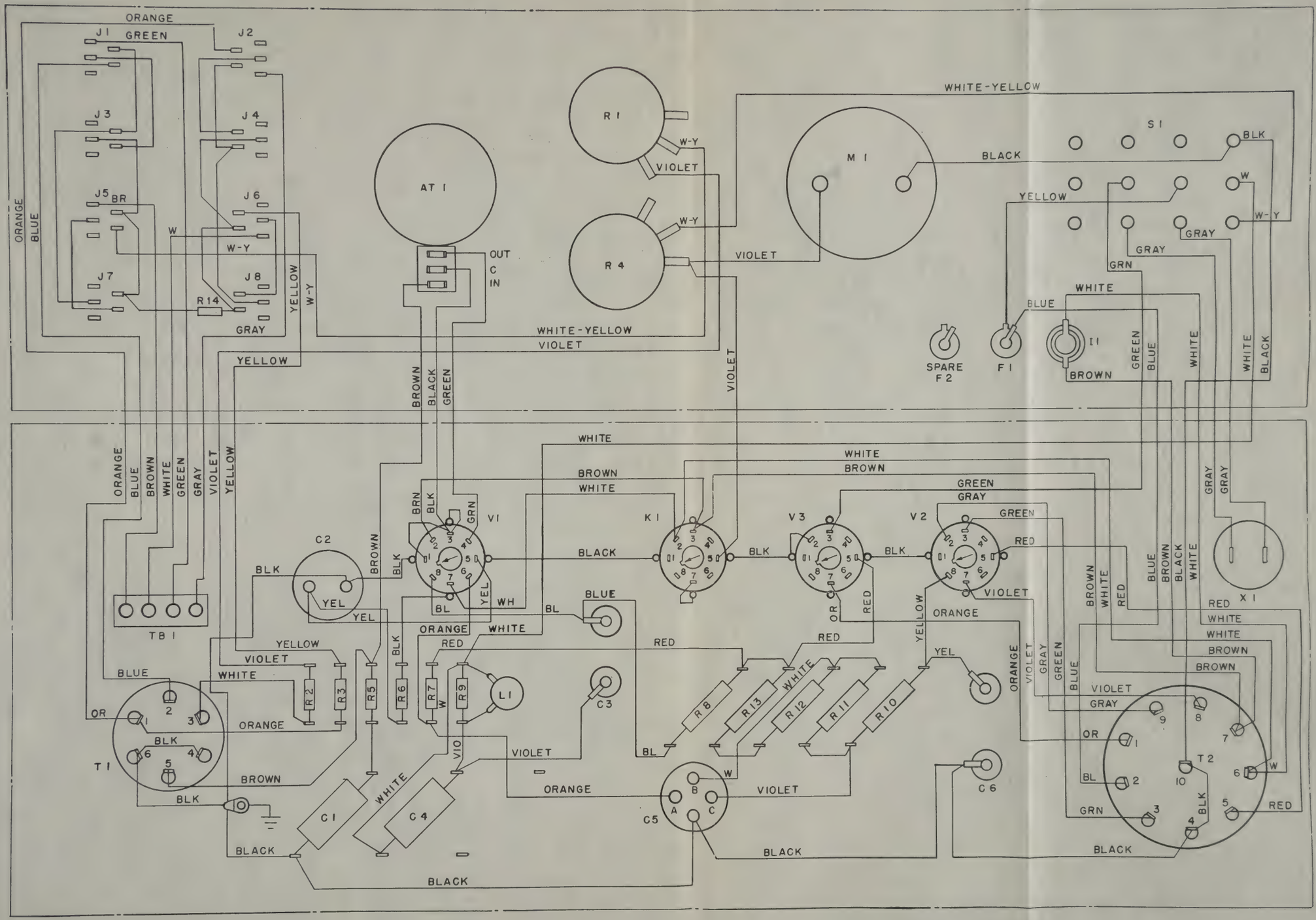
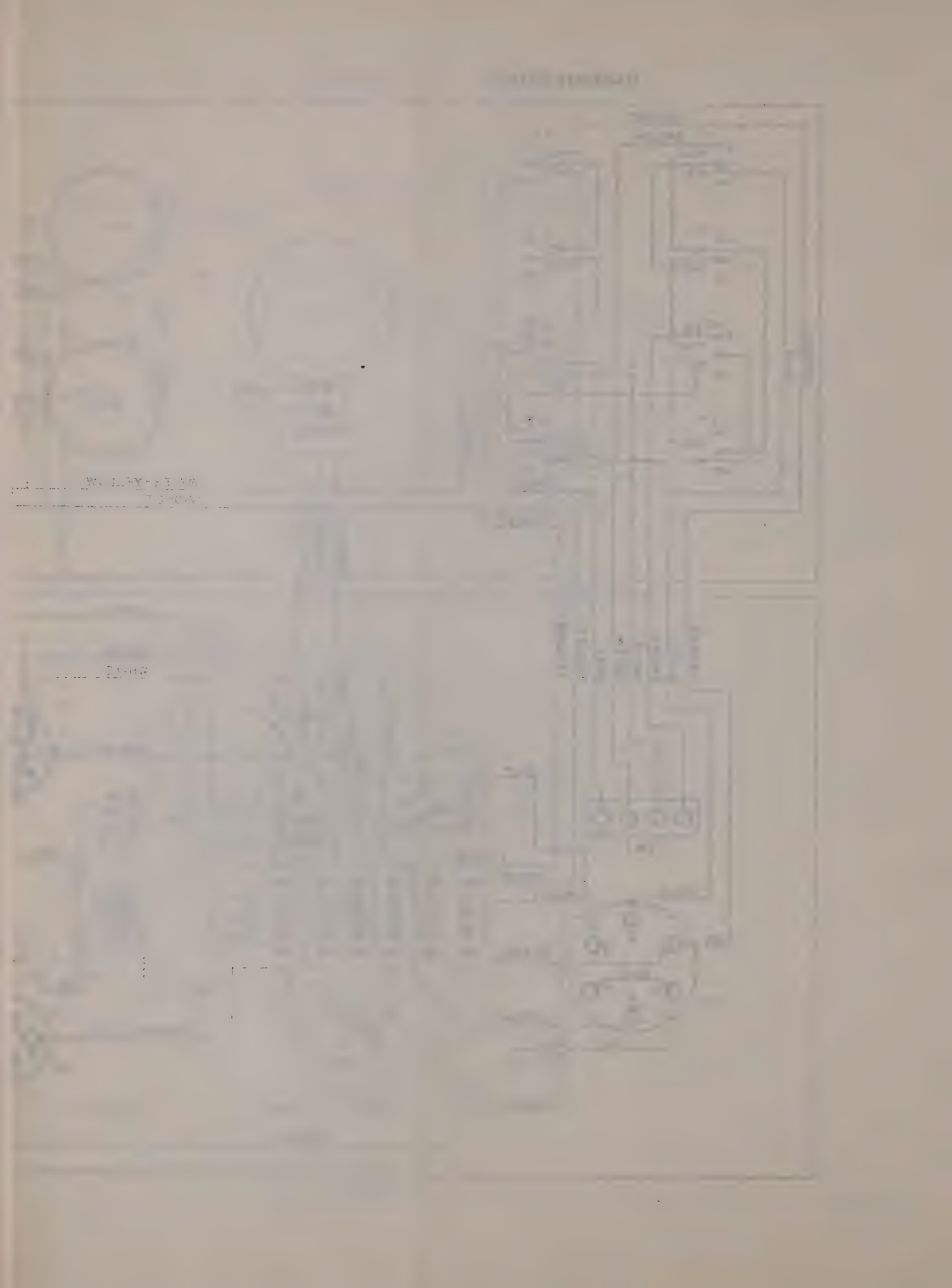


Figure 4-1. Wiring Diagram



SECTION 4
MAINTENANCE

1. OPERATOR'S MAINTENANCE.

a. FUSES.—If a second fuse fails upon replacement, circuit should be checked for component and circuit defects.

CAUTION:

DO NOT CONTINUE TO REPLACE FUSES UNTIL CAUSE OF FAILURE IS DETERMINED.

b. PILOT LAMP.—When the lamp is burned out, remove the pilot light jewel cap at front of panel and replace the lamp.

c. METER ZERO.—With the power switched off, the mechanical zero of the meter may be set by turning zero corrector screw (located below the scale opening) until the pointer is on the outer line at the left hand side of the meter.

d. TUBES.—The tubes should be replaced after 5,000 hours of use or at failure.

2. PREVENTIVE MAINTENANCE.

a. METER.—(1) If meter pointer sticks, tap scale glass lightly with finger tip. If meter pointer shows excessive friction, repair or replace meter.

(2) Always use the power switch on the unit for turning power on and off, allowing ample time between switching operations. This permits the relay to function properly, thus preventing meter damage.

(3) Before measuring an unknown signal, turn the range control knob as far clockwise as possible, to protect the meter.

3. CORRECTIVE MAINTENANCE.

a. TESTING.—The following information will be helpful in trouble shooting on the equipment covered in this Instruction Book. DC voltages from terminal to terminal should be checked with a 20,000 ohm/volt voltmeter.

b. TUBE OPERATING VOLTAGES.

Tube Type	*Function*	*Heater A.C.*	*Regulating Voltage D.C.*	*Current ma.*
6AG7	Amplifier	6.3		Plate 12
				Screen 3
6X5GT	Rectifier	6.3		30
VR150	Regulator		150	16.5

c. TUBE CHARACTERISTICS.

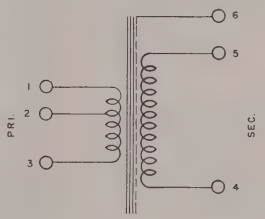
6AG7—Amplifier
Heater—6.3 V
Heater Current—.65 Amp.
Pin 1—Shell
Pin 2—Heater
Pin 3—Interlead Shield
Pin 4—Grid
Pin 5—Cathode
Pin 6—Screen
Pin 7—Heater
Pin 8—Plate

6X5GT—Full Wave Rectifier
Heater 6.3V
Heater Current 0.6 Amp.
Pin 1—No connection
Pin 2—Heater
Pin 3—Plate #2
Pin 5—Plate #1
Pin 7—Heater
Pin 8—Cathode
Peak Inverse Voltage—1250 V
Peak Plate Current Per Plate—210 max. ma.

d. WINDING DATA.

(1) Reactor—Audio Choke
Inductance—16 mh
No. Turns—1550
Wire Size—#38 or #40 Copper

(2) Transformer—Input
Impedance—Pri. #1—600 ohms.
Pri. #2—2,600 ohms
Impedance—Secondary 50,000 ohms
Turns Ratio—Pri. #1 to Sec. 1:9
Turns Ratio—Pri. #2 to Sec. 1:4.4
Frequency Response—50 - 20,000 cyc ±0.5 db.



(3) Transformer—Power
Primary—115 volts, 50-60 cycles
Secondary #1—600 V CT. .022 Amp. total current with CT. grounded
Secondary #2—6.3 V, 0.6 amp (Fil. of 6X5GT)
Secondary #3—6.3 V, 1.2 amps.

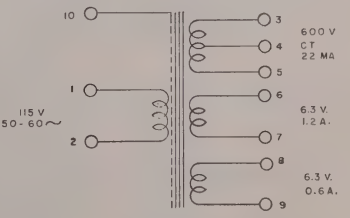


Figure 4-2. Wiring Diagram, Transformers

SECTION 5

TABLE 5-1. TABLE OF REPLACEABLE PARTS.

Reference Designation	Stock Numbers Signal Corps Standard Navy Air Force	Name and Description	Locating Function
	F16-Q-304809-100	TEST PANEL, AUDIO LEVEL: TS-629B/U; measures audio frequency output; includes indicating meter with range of –20 to +3 VU; range as terminating instrument –40 to +20 VU with meter reading 0; range as bridging instrument –20 to +20 VU with meter reading 0; power requirements 105-120 V, 60 cycles, single phase AC; dimensions 19 in. long, 5¼ in. wide, 8 11/16 in. deep; mounted on gray finished aluminum rack type panel and has gray finished steel housing.	
AT1	N16-R-91632-1001	ATTENUATOR, potential divider type: input impedance 60,000 ohms p/m 1%, output impedance variable; 30 steps, 2 db per step, 60 db total attenuation; 2¾ in. diameter x 2 1/16 in. deep; shaft ¼ in. diameter x 15/16 in. long from mounting surface; mounts with two #8-32 tapped holes on 1½ in. center line; Daven type P-630, Spec 1956.	Grid input level control V1
C1	N16-C-33622-5421	CAPACITOR, fixed, mica; .01 mf, 300 vdcw; JAN-C-5 type CM35B103K.	Compensating T1
C2	N16-C-20881-7636	CAPACITOR, fixed, electrolytic: 1000 mf, 25 vdcw; JAN-C-62 type CE31E102F.	Cathode V1
C3	N16-C-49981-9967	CAPACITOR, fixed, paper: 4 mf, 600 vdcw; JAN-C-25 type CP70E1FF405V.	Coupling V1 and meter compensating R9, C4 and L1
C4	N16-C-44633-7963	CAPACITOR, fixed, paper; .06 mf, 400 vdcw; case similar to JAN-C-25 type CP28; Aerovox type 489 MY.	Compensating M1
C5	N16-C-22631-1801	CAPACITOR, fixed, electrolytic; triple section, 20-20-20 mf, 450 vdcw; JAN-C-62 type CE33D200R.	Filter V2
C6		Same as C3.	Filter V2
F1	N17-F-14309-340	FUSE: 2 ampere; 1¼ in. long x 9/32 in. diameter type 4AG.	Line fuse
F2		Same as F1.	Spare line fuse
I1	G17-L-6297	LAMP, pilot: 6.3 V, 0.15 ampere; clear bulb; miniature bayonet base; GE type 47.	Pilot light
J1-J8	N17-J-39233-4670	JACK, telephone type: JAN-J-641 type JJ-072.	Input connectors
K1	N17-R-72914-8101	RELAY, thermal: SPST, normally closed; contact rating 115 V, 3 ampere AC, heater 6.3 V, 2 watts; plug-in type; 2 heater terminals, 2 contact terminals; hermetically sealed glass envelope; compensated for operation from –55°C; 20 seconds delay time; 1¼ in. diameter x 2⅝ in. long; mounts in standard octal tube socket; Amperite type 6C20.	Protecting M1
L1	N16-R-28833-5120	REACTOR, audio frequency: 16 mh inductance; ⅝ in. diameter x 11/16 in. long; has clearance hole for #6 machine screw through the center for mounting; Daven dwg A-1371-27.	Compensating M1

TABLE 5-1. TABLE OF REPLACEABLE PARTS—Cont'd

Reference Designation	Stock Numbers Signal Corps Standard Navy Air Force	Name and Description	Locating Function
M1	N17-M-22897-2892	METER, audio level: ac, rectifier type; –20 to +3 vu and 0-100 scale; scale arc black from –20 to 0 vu inclusive and green from 0 to +3 vu; black figures from –20 to 0 vu and 0-100 inclusive, green figures from 0 to +3 vu; Weston type 30, model 802.	Level indicator
R1	N16-R-90754-7740	RESISTOR, variable, wire-wound: 1,000 ohms p/m 10%; JAN-R-19 type RA30A1SA102AK.	Bridging calibration
R2	For replacement use SNSN N16-R-50128-431	RESISTOR, fixed, composition: 4500 ohms p/m 5%; ½ watt; A-B type EB.	Terminating
R3	N16-R-50128-431	RESISTOR, fixed, composition: 4700 ohms p/m 5%; ½ watt; JAN-R-11 type RC20BF472J.	Terminating
R4	N16-R-90868-6835	RESISTOR, variable, wire-wound: 2500 ohms p/m 10%; JAN-R-19 type RA30A1SA252AK.	Terminating calibration
R5	N16-R-050722-0431	RESISTOR, fixed, composition: 0.24 megohm p/m 5%; ½ watt; JAN-R-11 type RC20BF244J.	Compensating T1
R6	N16-R-49624-431	RESISTOR, fixed, composition: 150 ohms p/m 5%; ½ watt; JAN-R-11 type RC20BF151J.	Cathode V1
R7	N16-R-50380-431	RESISTOR, fixed, composition: 24000 ohms p/m 5%; ½ watt; JAN-R-11 type RC20BF243J.	Screen V1
R8	For replacement use SNSN N16-R-50039-131	RESISTOR, fixed, composition: 2700 ohms p/m 5%; 2 watt; JAN-R-11 type RC42BF272J.	Plate V1
R9	N16-R-49804-431	RESISTOR, fixed, composition; 560 ohms p/m 5%; ½ watt; JAN-R-11 type RC20BF561J.	Compensating M1
R10	N16-R-49967-106	RESISTOR, fixed, composition: 1500 ohms p/m 5%; 2 watt; JAN-R-11 type RC42BF152J.	Filter V2
R11		Same as R10.	Filter V2
R12		Same as R10.	Filter V2
R13		Same as R10.	Filter V2
R14	N16-R-50299-431	RESISTOR, fixed, composition: 11,000 ohms p/m 5%; ½ watt; JAN-R-11 type RC20BF113J.	Terminating input impedance compensating
S1	N17-S-75225-7569	SWITCH, toggle: 4PDT; phenolic body 1½ in. long x 1¼ in. wide x ¾ in. deep excluding terminals; bat type handle 11/16 in. long; 12 solder lug terminals; Cutler-Hammer type 7665K4.	Line power
T1	N17-T-62038-5501	TRANSFORMER, audio frequency; input type; primary 2,600 ohms impedance, tapped at 600 ohms; secondary 50,000 ohms impedance; hermetically sealed, steel case 3¼ in. deep x 2-7/16 in. diameter with mounting flange on one end 2-9/16 in. square; mounts with four clearance holes for #8 screw on 2-3/32 in. center lines; Daven part C-1371-11J-30.	Line to grid input transformer V1
T2	N17-T-74421-7967	TRANSFORMER, power, step-down and step-up: pri 115 V, 50-60 cps, single phase; secondary #1—6.3 V, .6 amp, #2—6.3 V, 1.2 amp, #3—600 V, .022 amp, center tapped; hermetically sealed steel case; 3¾ in. deep x 2⅞ in. diameter with mounting flange 3 in. square on one end; mounts with 4 clearance holes for #8 screw on 2⅜ in. centers; electrostatic shield between primary and secondary; electro-magnetic shield; Daven part C-1371-11J-31.	Power transformer

TABLE 5-1. TABLE OF REPLACEABLE PARTS—Cont'd

Reference Designation	Stock Numbers Signal Corps Standard Navy Air Force	Name and Description	Locating Function
V1	N16-T-56177	ELECTRON TUBE: JAN 6AG7.	Amplifier tube
V2	N16-T-56850	ELECTRON TUBE: JAN 6X5GT.	Full-wave rectifier tube
V3	N16-T-53060	ELECTRON TUBE: JAN OD3/VR-150.	Voltage regulating tube
W1	3E 1370 N17-C-48226-2038	CABLE ASSEMBLY, power, electrical: 2 conductor, stranded #16 AWG wire, rubber insulated; 600 V RMS rated maximum voltage; 6 feet, 4 inches overall length; one end terminated in plug for 115 VAC outlet; other end terminated in female receptacle; Signal Corps CD-370.	Power cord
W2	N16-C-2297-35	CABLE ASSEMBLY, special purpose, electrical: CO-144 cable; 2 conductor, stranded #18 AWG wire, rubber insulated, 491813 plug on each end; 4 feet 7 inches overall length; Daven dwg B-1371-48B-2; AN type CX-2549/U (4'7").	Input connector
W3	N17-C-48987-6401	CABLE ASSEMBLY, special purpose, electrical: CO-144 cable; 2 conductor, stranded #18 AWG wire, rubber insulated; 491813 plug on one end, 49109 plug on other end; 4 feet 6½ inches overall length; Daven dwg B-1371-48B-1; AN type CX-2550/U (4'6½").	Input connector
W4	N16-C-2297-40	CABLE ASSEMBLY, special purpose, electrical: CO-144 cable; 2 conductor, stranded #18 AWG wire rubber insulated; 491813 plug on one end, two Mueller #45-C clips with 1 red and 1 black #47 sleeve on other end; 4 feet 8 inches overall length; Daven dwg B-1371-48B-3; AN type CX-2551/U (4'8").	Input connector
X1	N17-C-73446-3001	CONNECTOR, receptacle: 2 flat male contacts; straight type; metal shell 1⅜ in. diameter x 1-1/16 in. deep; two .136 in. diameter holes on 1¾ in. centers in metal flange; current rating 15 amp, 125 volts; Hubbell type 6808.	Power connector
XF1	N17-F-74266-9092	FUSEHOLDER: extractor post type; phenolic body; ¾ in. diameter x 2⅜ in. long overall; 2 solder lug terminals; accommodates one #4AG cartridge fuse; has hole in extractor cap for checking fuse; Bussman type HCM-HBL.	Holds line fuse F1
XF2		Same as XF1.	Holds spare line fuse F2
XI1	N17-L-76768-1641	LAMP HOLDER: accommodates miniature bayonet base lamp; 2¼ in. long x 15/16 in. diameter over-all; chrome polish shell; green frosted lens; Dial Light Co. type 81410-622.	Holds pilot lamp I1
XK1	N16-S-63515-4160	SOCKET, electron tube: 8 pin octal; ceramic body; JAN-S-28A type TS101C01.	Holds thermal relay K1
XV1		SAME at XK1.	Holds amplifier tube V1
XV2		SAME at XK1.	Holds rectifier tube V2
XV3		SAME at XK1.	Holds voltage regulator tube V3

TABLE 5-2. MAINTENANCE PARTS KIT.

Key Designation	Quantity	Key Designation	Quantity	Key Designation	Quantity
C1	1	K1	1	R4	1
C2	1	L1	1	T1	1
C4	1	R1	1	T2	1

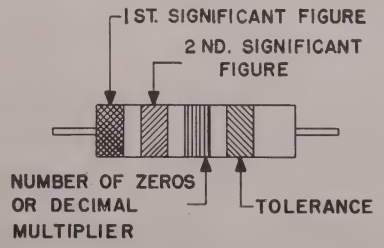
TABLE 5-3. CROSS REFERENCE PARTS LIST.

Jan Designation	Key Symbol	Navy Stock Number	Key Symbol	Navy Stock Number	Key Symbol	Army-Navy Type	Key Symbol
CM35B103K	C1	N16-R-91632-1001	AT1	N16-R-50039-131	R8	CX-2549/U (4'7")	W2
CE31E102F	C2	N16-C-33622-5421	C1	N16-R-49804-431	R9	CX-2550/U (4'6½")	W3
CP70E1FF405V	C3	N16-C-20881-7636	C2	N16-R-49967-106	R10	CX-2551/U (4'8")	W4
CE33D200R	C5	N16-C-49981-9967	C3	N16-R-50299-431	R14		
JJ-072	J1	N16-C-44633-7963	C4	N17-S-75225-7569	S1		
RA30A1SA102AK	R1	N16-C-22631-1801	C5	N17-T-62038-5501	T1		
RC20BF472J	R3	N17-F-14309-340	F1	N17-T-74421-7967	T2		
RA30A1SA252AK	R4	G17-L-6297	I1	N16-T-56177	V1		
RC20BF244J	R5	N17-J-39233-4670	J1	N16-T-56850	V2		
RC20BF151J	R6	N17-R-72914-8101	K1	N16-T-53060	V3	Signal Corps Stock Number	Key Symbol
RC20BF243J	R7	N16-R-28833-5120	L1	N17-C-48226-2038	W1		
RC42BF272J	R8	N17-M-22897-2892	M1	N16-C-2297-35	W2	3E 1370	W1
RC20BF561J	R9	N16-R-90754-7740	R1	N17-C-48987-6401	W3		
RC42BF152J	R10	N16-R-50128-431	R2	N16-C-2297-40	W4		
RC20BF113J	R14	N16-R-90868-6835	R4	N17-C-73446-3001	X1		
JAN 6AG7	V1	N16-R-050722-0431	R5	N17-F-74266-9092	XF1		
JAN 6X5GT	V2	N16-R-49624-431	R6	N17-L-76768-1641	XI1		
JAN OD3/VR-150	V3	N16-R-50380-431	R7	N16-S-63515-4160	XK1		
TS101CO1	XK1						

TABLE 5-4. APPLICABLE COLOR CODES AND MISCELLANEOUS DATA.

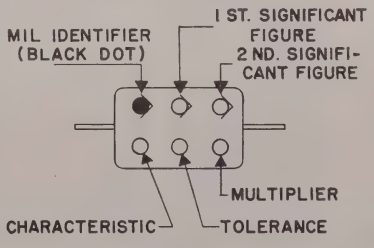
Resistor Color Codes

JAN Color Code For Fixed Composition Resistors

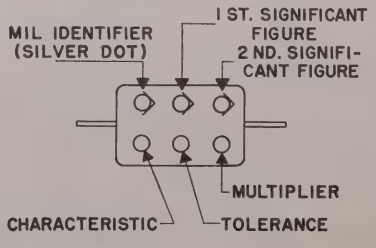


Capacitance Color Codes

JAN 6 dot color code for mica dielectric capacitors per MIL-C-5



JAN 6 dot color code for paper dielectric capacitors per MIL-C-91A



RESISTORS		CAPACITORS					
Tolerance (percent ±)	Decimal Multiplier	Significant Figure or Number of Zeros	Color	Multiplier[1]	Tolerance (percent ±)	Characteristic	
						Paper	MICA
———	———	0	Black	1	20 (M)	A	
———	———	1	Brown	10	———	E	B
———	———	2	Red	100	2 (G)[3]		C
———	———	3	Orange	1000	30 (N)[2]		D
———	———	4	Yellow	10,000[2]			E
———	———	5	Green	———			F
———	———	6	Blue	———			
———	———	7	Purple	———			
———	———	8	Gray	———			
———	———	9	White	———			
5 (J)	0.1	———	Gold	0.1[3]	5 (J)[3]		
10 (K)	———	———	Silver	———	10 (K)		
20 (M)	———	———	No Color	———			

[1] The multiplier is the factor by which the two significant figures are multiplied to yield the nominal capacitance.

[2] Applicaple to paper capacitor only.

[3] Applicaple to mica capacitors only.

TABLE 5-5. LIST OF MANUFACTURERS.

Abbreviations	Prefix	Name	Address
Aerovox	CAW	Aerovox Corporation	700 Belleville Ave., New Bedford, Massachusetts
A-B	CBZ	Allen-Bradley Company	136 W. Greenfield Ave., Milwaukee 4, Wisconsin
Amperite	CAGK	Amperite Company, Inc.	563 Broadway, New York 12, New York
Bussman	CFA	Bussman Manufacturing Co.	2538 W. University St., St. Louis, Missouri
Cutler-Hammer	CAE	Cutler-Hammer, Inc.	1391 W. St. Paul Ave., Milwaukee 1, Wisconsin
Daven	CDN	The Daven Company	191 Central Ave., Newark 4. New Jersey
Dial Light Co.	CAYZ	Dialight Corporation	60 Stewart Ave., Brooklyn 37, New York
GE	CG	General Electric Company	Schenectady 5, New York
Hubbell	CHU	Harvey Hubbell, Inc.	State and Thomas St., Bridgeport 5, Connecticut
Mueller	CBIT	Mueller Electric Co.	1597 E. 31st St., Cleveland 14, Ohio
Weston	CV	Weston Electrical Instrument Corporation	619 Frelinghuysen Ave., Newark 5, New Jersey

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